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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 3903.3-2011

Footwear - General test methods - Peeling strength

鞋类 整鞋试验方法 剥离强度

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1 Scope

China's national test method for the peel strength of footwear. It specifies the terms and definitions, the test sample and conditioning, the test instrument and the methods. Peel strength measures the force needed to separate the sole from the upper, and it is the single most important mechanical property of a shoe's construction. A sole that comes away from the upper is the complaint that no repair satisfies and no customer accepts, and it is a failure of the bond rather than of either material. That bond is made by adhesive, and its strength depends on things that are invisible in the finished shoe: whether the surfaces were roughened and cleaned properly, whether the primer and adhesive suited both materials, whether the open time was respected, and whether the press applied enough pressure for long enough. The peel test is how a factory verifies all of that on a sample from production, which is why it is run continuously rather than as a type test.

This Part of GB/T 3903 specifies the test method for the peeling strength between the sole and the upper of a whole shoe or between the outsole and the outer midsole. This Part applies to footwear made by molding, vulcanization, injection molding, perfusion, gluing and other processes. This Part does not apply to sewn footwear.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1 peeling strength of whole shoes The force per unit width when the peel tester peels the sole and the upper or the outsole and the outer midsole apart to a specified width.

2.2 off-bonding A phenomenon of just-off-bonding along the cutting edge between the

objects being tested.

3 Test sample and conditioning

3.1 The test sample shall be finished shoes made 48 hours after manufacture. There shall be no obvious defects on the test parts. The test samples shall be left for at least 4 hours before testing.

3.2 Each set of test samples from the same batch of products shall generally contain no less than one pair of shoes.

3.3 The test environment must be laboratory room temperature.

4 Test instrument

4.1 Peel tester, maximum load not less than 392 N.

4.1.1 Dynamometer

4.1.1.1 For elastic body, the linear deviation, indication deviation and indication variation shall not exceed 3%.

4.1.1.2 When using a force table, do not consider linear deviation.

4.1.1.3 The dynamometer shall be inspected at least once a year and shall be re-inspected after replacing, disassembling or moving the dynamometer parts.

4.1.1.4 The dynamometer shall be tested in accordance with Appendix A.

4.1.2 Peeling knife

4.1.2.1 The blade is located on the center line (neutral layer) of the dynamometer, and the curvature of the blade shall be basically consistent with the curvature of the measured part. The specifications and dimensions of the peeling knife are shown in Figure 1.

4.1.2.2 The blade width is available in two specifications. (20 ± 0.2) mm and (10 ± 0.2) mm, which may be selected according to the relevant product standards during testing. The downward speed of the peeling blade is (20 ± 2) mm/min.

4.1.3 The distance between the positioning rod and the pull rod shall not be less than 50 mm.

4.1.4 The graduation value of the force gauge is 1 N, and the graduation value of the micrometer is 1 μ m.

4.2 Steel ruler, graduation 1 mm.

5 Test methods

5.1 Adjust the force gauge or micrometer to zero.

5.2 Adjust the force gauge to an upward tilt of 5° ~ 10° with respect to the horizontal plane.

5.3 Adjust the downward speed of the peeling blade (i.e., the downward speed of the blade) to (20 ± 2) mm/min.

5.4 Placement of test samples

5.4.1 Install the shoe on a matching shoe last, ensuring that the shoe fits the last at the stripping position; place the shoe naturally and flatly on the horizontal plate of the tester's clamp; then clamp the shoe; adjust the height and front-to-back position of the clamp so that the stripping blade is aligned with the test area. The length of the test part extending from the test bench is 20 mm ~ 40 mm.

5.4.2 For outsoles with protruding edges, the blade should rest on the edge of the outsole. Without causing the blade to slip, the blade shall be as close to the joint seam of the test part as possible. For outsoles without protruding edges or outsole and midsole, the blade shall rest on the outsole below the joint seam of the test part. Under no circumstances shall the blade cut the joint seam between the upper and the sole.

5.4.3 If the shoe is tilted left or right and cannot be aligned with the blade, it is permitted to place a washer under the sole to straighten the shoe.

5.4.4 After the bottom of shoe or bottom wall is cut, the force gauge or micrometer may deviate from the zero position. This is normal. However, the deflection of the dial indicator must not exceed 10 μ m, and the force gauge must not exceed 5 N. Do not adjust the dial indicator or force gauge at this time.

5.5 After starting the machine and running the peeling blade downward, attention shall be paid constantly to the changes in the joint conditions of the test area. If off-bonding is found, stop the machine immediately and read the meter value.

5.6 If any of the following conditions occurs, stop the test and record the maximum value.

a) The upper and sole cannot be peeled off after three tests due to special reasons such as the sole being too soft or too thin;